SUBSTITUTE SPECIFICATION – CLEAN VERSION

INFUSION SET

THE TECHNICAL FIELD

[0001] The invention relates to an infusion set for an intermittent or continuous administration of a therapeutical substance, such as insulin. An infusion set comprises an infusion part with a cannula to penetrate the skin of a person and a connector for connecting the infusion part with a medical device preferably a medical delivery device such as an insulin pump.

[0002] An infusion set has in its assembled form a substantially planar rear side and a relatively large width compared to its thickness, thus allowing it to lie flat on the patient's skin and thereby minimizing the discomfort of carrying the infusion set.

[0003] The infusion part is placed in the patient for a longer and not specified time period while the connector is supposed to be connected and disconnected from time to time. Hereby it is possible for the patient to disconnect from the medical device, move around and at a later point re-connect to the medical device. Further it is possible to shift between different medical devices using the same infusion part and thereby there is only need for one penetration of the skin which provides less discomfort to the patient.

PRIOR ART

[0004] US-A-5.522.803 discloses an infusion set having an infusion part and a connector. The infusion part comprises a soft plastic cannula in liquid communication with a cavity for receiving a needle from a connector, two sloping guiding holes and two retention devices; and the connector comprises a cannula, two square guiding pins and two arms with a hooking part for gripping the retention device of the infusion part and operating in the main plane of the infusion part.

[0005] US-B1 -6.572.586 discloses an infusion set for administration of a fluid to a subcutaneous layer and include a cannula housing adapted for mounting onto a patient's skin and a needle housing for connection to the cannula housing. The

needle housing has a pair of flexible and a resilient band connected to the sidewalls. The resilient band is lockably engage able with the cannula housing thereby securing the housings together, and the resilient band is releasable from the cannula housing when pressing the sidewalls toward each other to deform the resilient band. A hollow needle extends out of a main body of the needle housing for delivering fluid to the cannula from a fluid source. The walls of the needle housing extend beyond a distal end of the hollow needle to prevent needle contact with contaminated surfaces an inadvertent injury.

[0006] In both of these infusion sets two arms are formed along the sides of the connector part and the movement performed to unrelease the connector from the infusion part is in both cases pressing the two arms together. Compared to these to constructions the present invention is of a more simple form and also the locking mechanism according to the invention allows for the user to actually see when the arms are unlocked, especially if the infusion part and the connector are toned in different colors.

[0007] Given that the infusion part is supposed to be connected and especially disconnected several times with the connector it is important that this operation is painless and simple to perform.

[0008] The object of the invention is to provide an infusion set with a coupling mechanism which can be connected and separated with as less discomfort to the patient as possible, and which infusion set is also easy for the patient to find out and to operate.

[0009] According to the invention there is provided an infusion set comprising an infusion part for insertion into a patient and a connector for connecting the infusion part with a medical device through a tube. Thes connector is axially displaceable relative to the infusion part, said infusion part comprising an adhesive support, a base part with a first set of guiding means and at least two retention devices for locking the connector to the infusion part, a cannula extending from said base part and being in fluid communication with a cavity which is optionally covered with a membrane, said cavity being further adapted to receive a second

cannula extending from the connector, which second cannula is in fluid communication with the tube, a second set of guiding means adapted to fit with the first set of guiding means and at least two arms where the retention devices are extending from the upper surface of the main surface of the base part and the arms comprise means corresponding to the retention means.

[0010] The above described infusion set is easier to disconnect and will seem safer to use for the patient than previously known infusion sets. All that is needed to separate the connector from the infusion part is a slight simultaneous pressure on the two arms of the connector and the user will be able to see how the connection/disconnection between the infusion part and the connector takes place.

[0011] With the term cavity is meant the inner lumen of the cannula or the extension of the cannula.

[0012] In a preferred embodiment the connector is symmetrical both around the main plain of the connector and around the plane being perpendicular to the main plane and being parallel to the central axis, thus allowing the connector to be connected to the infusion part no matter which of the main sides is facing upwards. This results in an easier operation of the infusion set.

[0013] The arms of the connector can appropriately be provided with gripping means for getting a better grip of the connector. Examples of such gripping means could be but are not limited to rims, grooves, recesses, and a roughened surface optionally of another material than the connector itself, preferably recesses are used. This results in a safer and more comforting operation of the infusion set since the risk that the fingers slip during handling resulting in unintended movements of the infusion part and the cannula is reduced.

[0014] In one embodiment of the invention the connector has a reduced material content e.g. in the form of at least one groove, preferably at least two grooves, placed where the arms are connected to the central part of the connector comprising the second set of guiding means (8), thus allowing the arms of the connector to move perpendicular to the base part while the second set of guiding means are stationary. This makes it possible to disconnect the connector from the

infusion part by lifting the arms instead of pressing them towards each other. Hereby it is achieved that connection/disconnection can be performed in a manner which at the same time reduces the stresses in the material during the operation, eases the operation of the locking mechanism and reduces the patient's unpleasantness during the connection/release of the connector.

[0015] In another embodiment retention devices are positioned on a particularly flexible part of the base part. The flexible part can be provided by choosing an appropriate material for the base part or by providing very thin parts of material between the retention parts and the center of the base part, but preferably the base part of the infusion part has at least two cuttings forming at least two flaps. The formed flexible parts are able to in an elastic manner to move out of the main plane of the infusion part. Hereby the same advantages during connection/release as described above are obtained.

[0016] In a preferred embodiment the cannula of the infusion part penetrates the adhesive support, thus stabilizing the position of the infusion part relative to the point of skin penetration to an even greater extend. Further this minimizes the risk that the cannula is accidently withdrawn from the patient.

[0017] In a preferred embodiment the adhesive support is a plaster.

[0018] In a preferred embodiment the infusion part and the connector are made from two different plastics materials, such as two different types of polypropylene.

[0019] In a preferred embodiment there is a visual difference in the toning of the connector and the base part of the infusion part. Hereby it is achieved that it is easier for the patient to see the separation line between the two units resulting in an easier operation of the locking mechanism.

[0020] In a preferred embodiment the retention devices are in form of at least two steps placed on either the infusion part or the connector and a matching carving in the other part. Preferably the step has a side with a triangular shape thus forming the step as a sloping hill. Preferably the retention devices are placed on the infusion part and the matching carvings are placed in the connector's arms.

[0021] In a preferred embodiment the tube is a flexible plastics material which preferably is connected with the rest of the connector by means of glue.

[0022] Preferably the medical delivery device is a drug delivery device such as an insulin delivery device e.g. in the form of an insulin pump.

[0023] The cannula of the connector can be a hard cannula, preferably a metal cannula such as a steel cannula. Also the cannula of the connector can be made of a plastics material and/or being blunt.

[0024] In a preferred embodiment the cannula is a soft cannula preferably a soft cannula made of a plastics material. Preferred plastics materials for the soft cannula are materials which are sufficiently flexible to bend, when the patient moves and sufficiently rigid to avoid kinking, closing off the drug supply. Further the material must be compatible with medical use i.e. irritation of the skin must be kept at a minimum, being non-toxic it must not decompose in the body, etc. Thermoplastic elastomers (TPE) are a type of material which fulfils these requirements. Examples of such useful elastomers are: polyester ethers, ECDEL, styrene based TPE, olefin based TPE, urethane based TPE, ester based TPE, amid based TPE, polyolefins and silicone rubbers. In a preferred embodiment the material is selected from the group consisting of polypropylene, C-FLEX™, mixtures of C-FLEX™ and polypropylene, LUPOLEN™ 1840H, LUPOLEN™ 3020D, PELLETHANE ™ 2363-75D, PELLETHANE™ 2363-55D, TECOTHANE ™ and CARBOTHANE™.

[0025] In a preferred embodiment the infusion part and the connector are made of polypropylene.

[0026] Given that the infusion part is supposed to be connected and especially disconnected several times with the connector it is important that the cannula of the connector is guided safely into the cavity of the infusion part and that the cannula in the disconnected situation is protected as much as possible. It is therefore a further object of the invention to provide an infusion set with an improved guiding mechanism and with an improved protection of the connector cannula.

[0027] In a preferred embodiment the connector cannula is extending from the central part of the connector and being placed in a withdrawn position relative to the front of the central part and at least one of the first set of guiding means comprises at least two stabilizing fins.

[0028] The above described invention provides an infusion set with an improved protection of the cannula of the connector thus allowing the connector to be connected and disconnected from the infusion part more times than in the previously known infusion sets.

[0029] A lot of patients e.g. insulin patients have to or may desire to insert an infusion device or to place a subcutaneous sensor or the like themselves. For some persons it is a troublesome process to perform the skin penetration themselves, they therefore need a device which assists them in this process thereby making the process less problematic.

[0030] The document US 2003/0225373 discloses an insertion device for inserting an infusion part or a sensor into a patient. The device comprises a housing, a coil spring, a safety device and part for angling the insertion into the patient. However the apparatus is relatively complicated to manufacture industrially and further the device has to be loaded manually by the patient by a rather complicated procedure.

[0031] WO 03/026728 A1 discloses an injector device comprising a housing, a spring, a slidable bar, a locking mechanism and a needle.

[0032] It is a further object of the invention to provide an improved insertion device which is easy to manufacture and which is suitable for being delivered in a loaded form or at least being easier to load. Especially elderly people who can have some motor problems need an insertion device which exists in a pre-loaded form.

[0033] The advantage in essentially vertical insertion is that it is easier to control the dept of the needle penetration and thereby the dept of the cannula. This is important in self-insertion of the infusion part.

[0034] In the following the invention will be described in further details with reference to the figures.

[0035] Figure 1 shows one embodiment of an infusion set where the infusion part and the connector are unified.

[0036] Figure 2 shows one embodiment of the infusion set where the infusion part and the connector are separated.

[0037] Figure 3 shows the same embodiment of the separated infusion set as in figure 2 from a different angle.

[0038] Figure 4 shows a second embodiment of a separated infusion set from a first angle.

[0039] Figure 5 shows the second embodiment of the infusion set from a different angle.

[0040] Figure 6 shows a first embodiment of an injector device separated from the infusion part.

[0041] Figure 7 shows the first embodiment of the injector device joined with the infusion part.

[0042] Figure 8 shows the first embodiment of the injector device joined with the infusion part.

[0043] Figure 9 shows the first embodiment of the injector device where the pivoting member is embracing the needle.

[0044] Figure 10 shows the first embodiment of the injector device in the loaded position.

[0045] Figure 11 shows the first embodiment of the injector device in the loaded position from a second angle.

[0046] Figure 12 shows a second embodiment of the injector device in a loaded and secured state.

[0047] Figure 13 shows the second embodiment of the injector device in a ready to use state.

[0048] Figure 14 shows the second embodiment of the injector device after insertion of the needle and before removing the injector from the infusion part.

[0049] Figure 15 shows the second embodiment of the injector device after separating the injector from the infusion part.

[0050] Figure 16 shows the second embodiment of the injector device after the pivoting arm has been positioned to embrace the needle.

[0051] Figure 17 shows the second embodiment of the injector device after the pivoting arm has been positioned to embrace the needle seen from another angle.

[0052] Figure 18 shows an infusion set placed on the skin.

[0053] Figure 19 shows the second embodiment of the injector device together with a credit card.

[0054] Figure 20 shows a third embodiment of the injector device.

[0055] Figure 21 A-D shows assembling of the infusion part and injector device according to the third embodiment.

[0056] Figure 22 A-B shows the third embodiment of the injector device prepared for insertion.

[0057] Figure 23 A-B shows the adhesive support of the infusion part hooked to the slidable member.

[0058] Figure 24 A shows the injector device after insertion with an infusion part and figure 24 B shows the injector device after insertion without the infusion part.

[0059] Figure 25 shows the third embodiment of the injector device after insertion and embracing the needle.

[0060] Figure 26 shows a third embodiment of an infusion part placed on a mounting pad with two separate pieces of release liner.

[0061] Figures 35 A-D and 36 A-D show the different steps when using the injector device for injecting the infusion part.

[0062] Fig. 1-3 illustrates an embodiment of an infusion set. The infusion set comprises an infusion part (0B) and a connector (0A). The infusion part (0B) comprises a base part (2) having a main plane which, when the infusion set is attached to a patient, is essentially parallel to the skin of the patient, and a shoulder part (2a) protecting the connector part (0A) from being released unintentionally.

Said base part (2) comprises a first set of guiding means (13) which in this case has the form of two stabilizing fins. The base part further comprises two retention devices (4) extending from the upper surface of the base part in this case in form of two steps. Mounted on the inner surface of the infusion part is an adhesive support (1) which in this case is a plaster. A cannula (5) is extending from the base part (2) and is penetrating the adhesive support (1) being in fluid communication with a central cavity (3). The cannula (5) is preferably a soft cannula but could also be made of metal. The cavity (3) optionally being covered by a membrane is adapted to receive a second cannula (6) extending from the connector. In the embodiment shown in fig. 2-5 the second cannula (6) is extending from the central part of the connector and is placed in a retracted position relative to the front of the central part. In this embodiment the base part (2) has two cuttings (12) creating two flaps on which the retention devices (4) are mounted. The connector (0A) comprises two arms (9) having four carvings (10) adapted to fit with the retention devices (4). The connector (0A) is symmetrical around the main plane and around the plane perpendicular to the main plane and parallel to the main axis thus allowing the connector to match with the base part in two ways. The cannula (6) is in fluid communication with the tube (7) which provides the connection to a medical device such as an insulin pump. In this embodiment the central part of the connector has a second set of guiding means (8) in form of two grooves placed symmetrically around the main plane of the connector. In this embodiment the connector further has gripping means (11) in form of recesses. The gripping means 11 are optional and can be selected from the group consisting of rims, grooves, recesses or a roughened surface optionally of another material than the connector itself

[0063] Fig. 4 and 5 show another embodiment of the invention where the connector has two grooves (14) which in this case are placed symmetrically around the main plane of the connector. However it is not necessary for the grooves to be places symmetrically around the main plane since they are not coupling with the infusion part.

[0064] Whether the infusion set is intended to be inserted manually or by an injector the infusion part (OB) and the connector (OA) are delivered to the user as two separate units in sterile packages. When inserted manually the infusion part (OB) will at delivery be combined with a needle unit with the same locking and guiding means (8) as the connector. The needle unit is provided with an insertion needle extending from the central front which insertion needle at delivery extends through and beyond the end of the cannula (5). The needle unit's only function will be to penetrate the user's skin where after the needle unit is removed and replaced with the connector (0A) leaving the cannula (5) subcutaneous.

[0065] The connector (0A) can be connected to a luer coupling member through the tube (7). Through the luer coupling it is possible to administer a suitable therapeutical substance, such as insulin from a pump. The connector can also be a sort of closing part with a suitable entrance for an inserting needle of a syringe. Such a closing part can stay in position for up till three days while the user can have medication, e.g. insulin injected through the entrance in order to reduce trauma to the skin caused by repeated penetration of the skin.

[0066] It is important for the user that it is easy to change i.e. to engage and to disengage the infusion part (0B) and the connector (0A) even when the user has reduced dexterity. The present invention complies with this purpose as the movement used to unlock the infusion part (OB) from the connector (OA) is pressing the connector between the first finger and the thumb which is simple and easily performed movement. Also the oppositely directed forces from respectively the first finger and the thumb pushing toward each other, are not only used to unlock the device but is also used when pulling the connector away from the infusion part (OB). In order to make it easier to disengage the connector (OA) the arms (9) can be made very flexible, either by choosing a soft and flexible material or by making the fastening of the arms (9) to the central part more or less rigid e.g. by varying the size of the grooves (14) on the shoulder of the connector (0A).

[0067] Although the arms (9) are very flexible the danger of accidently pulling the connector away from the infusion part when positioned on the skin of the user

is quite small as the device has to be exposed to a simultaneous pressure from both sides.

[0068] Another advantage of the invention according to the present invention is that only a very small amount of material need to be used when producing the infusion part. The infusion part (0B) can be reduced to:

[0069] - a slim central part comprising the cannula (5), the cavity (3) and guiding means (13),

[0070] - a shoulder part (2a) connected to the central part and protecting the ends of the movable arms (9) of the connector when the connector is engaged with the infusion part, and

[0071] - a base part (2) which has been reduced to two arms connected to the central part which arms are provided with the retention means (4).

[0072] Fig. 6 -11 shows a first embodiment of an injector device (29) which can be used for injection of the infusion part (0B) of the infusion set. In fig. 6 the injector device is separated from the infusion part (0B) and fig. 7 and 8 show the same injector device (29) joined with an infusion part (0B). The injector device comprises a housing (30) with two longitudinally extending guiding means (31) formed as grooves in this embodiment and a longitudinally slidable member (32) having guiding means (31 a), in this embodiment a rim, corresponding to the guiding means (31). A penetrating needle (35) is extending from the front part of the slidable member (32), and the needle (35) is at the end where it is fastened to the slidable member (32) surrounded by guiding means corresponding to the guiding means (13) on the infusion part (0B). The slidable member (32) is capable of moving from a retracted position to a forward position, and is driven from the retracted position to the forward position by a spring (34). The spring is located between the slidable member (32) and the back (33) of the housing. Optionally there is a spring support (37) (fig. 8) which fits with the back of the housing thereby minimizing the risk of a malfunctioning spring. The injector device further comprises locking means (38) for maintaining the spring in a compressed state and release means (39) for disengaging the locking means. When the locking means

(38) are disengaged, the spring (34) drives the slidable member (32) to its forward position, thus introducing the cannula positioned at the front end of the infusion part (0B) into the patient by means of the needle (35). After the introduction of the cannula, the injector device including the insertion needle (35) is withdrawn from the infusion part (0B) leaving the insertion needle in an exposed position. The pivoting member (36) can then be swung into a position where it embraces the needle (35) as shown in fig. 9.

[0073] Fig. 10 and fig. 11 show the same embodiment of the injector device in a loaded and secured position. Part of the pivoting member (36) acts as locking means (38). In Figure 10 it can be seen how the needle (35) fits into the cannula (5) of the infusion part. The needle (35) will bring the cannula (5) with it during the skin penetration. After penetrating the skin the needle (35) secured to the injector will be withdrawn leaving the cannula inserted in the patient. In fig. 11 the locking means are shown said locking means are disengaged when the tab (38) is pushed over the edge of the outer side of the back (33) of the housing.

[0074] Figures 12 to 17 show a second embodiment of the injector device according to the invention where the pivoting member (36) is fastened centrally in relation to the slidable member (32). Figure 12 shows the injector device in a state where the pivoting member (36) protects the needle prior to injection of the cannula (5) of the infusion part (OB). The figure shows the housing (30) with another type of longitudinally extending guiding means (31), in this case a bar. The housing further has gripping means (40), preferably in the form of recesses, as means for getting a better grip of the injector device.

[0075] Centrally positioned release means (39) is shown on one of the main faces of the injector device. The advantage of a one button release mechanism is that the risk of a slanting injection is reduced.

[0076] In fig. 13 is shown an injector device prepared for insertion of the needle. The pivoting member is positioned away from the embracing position in an angle v « 90° in relation to the main axis of the injector device where the main axis is coincident with the insertion needle. The adhesive support (1) is positioned

in such manner that the cannula (5) of the infusion part (0B) and the therein positioned needle (35) penetrates the adhesive support through an opening in the release liner. When the pivoting member is positioned essentially perpendicular to the main plane of the injector device it can provide a helping mean for achieving essentially vertical injection of the needle. Further fig. 13 shows the needle (35) of the injector device inside the cannula (5). In fig. 14 the injector device is in a released state where the needle (35) would have penetrated the skin. The housing in the embodiment of fig. 14 has a stopping tab (43) corresponding to a protrusion on the slidable member that keeps the slidable member (32) within the housing (30) thereby making it easier to withdraw the needle since there is no risk that the slidable member slides out of the housing. In fig. 15 the injector device has been withdrawn, leaving the cannula (5) of the infusion part (0B) inserted in the patient. In fig. 16 and 17 the pivoting member (36) is in a position where it embraces the needle (35) thereby protecting the surroundings from coming into contact with the used needle (35). In fig. 18 the infusion part (OB) has been brought from the essentially vertical insertion position to a position essentially parallel to the skin.

[0077] Fig. 19 shows the injector device together with a credit card to illustrate the size of the injector device.

[0078] In fig. 20 is shown a third embodiment of the injector device together with an infusion part (0B). This embodiment also has a housing (30) with longitudinally extending guiding means (31) and a longitudinally slidable member (32) of a different construction compared to the two first embodiments. Also the pivoting arm (36) and the spring (34) can be seen in this figure. In this embodiment the stopping tab (43) is placed centrally and has the form of a protrusion raising form the lower side of the housing (30). The release means (39) comprises two buttons placed on each side of the housing (30).

[0079] In fig. 21 A-D it is shown how the infusion part (0B) along with the slidable member (32) and the spring (34) of the third embodiment fit into the housing (30). The unit (?) shown between the pivoting arm (36) and the insertion

part (0B) is an adapter which makes it possible to use a standard injector for different guiding means (13) on the infusion part (0B).

[0080] In fig. 22 A-B is shown fixing means (44) placed on the pivoting member (36). It is possible to temporarily attach a part of the adhesive support (1) to the fixing means in order to secure the position of the adhesive support in such a way that the adhesive surface of the support (1) will be turned towards the skin of the patient. Further release means (39) in the form of two buttons, one on each side of the housing (30), can be seen as well as the protruding stopping tab (43).

[0081] Fig. 23 A-B shows in further details and without the housing how the adhesive support (1) is hooked to the fixing means (44) due to at least one cutting (46) in the adhesive support (1).

[0082] Fig. 24 A shows the third embodiment of the injector device with an infusion part after insertion and 24 B shows the injector device after insertion and after the injector device has been removed from the insertion part (OB).

[0083] In fig. 25 the pivoting member (36) of the injector device is in a position embracing the needle. A locking tab (45) fixes the pivoting arm in this position. This makes certain that the needle stays embraced by the pivoting arm and thereby minimizes the risk of somebody getting hurt by the needle.

[0084] Fig. 26 illustrates a third embodiment of an infusion part (0B). The infusion part (0B) comprises a base part (2) which base part (2) comprises a first set of guiding means (13) in the form of two stabilizing fins. The base part (2) comprises two retention devices (4) extending from the upper surface of the base part (2) and having a triangular form. The side of the triangular retention device facing the shoulder part (2a) is approximately perpendicular to the surface of the base part (2) and the side facing away from the shoulder part (2a) is sloping from the top of the retention device (4) to the surface of the base part (2). Mounted on the inner surface of the infusion part (0B) is the adhesive support (1). The cannula (5) is extending from the shoulders (2a) of the base part (2) and is penetrating the adhesive support (1) being in fluid communication with the central cavity (3). The cavity (3) which can be covered by a membrane is adapted to receive a second

cannula (6) extending from the connector. In this embodiment the base part (2) has two wide cuttings (12) creating two narrow flaps in the base part (2) on which the retention devices (4) are mounted.

[0085] The distance between (I) the side of the retention device (4) closest to the central part of the infusion part (OB) and (II) the central part of the infusion part (0B) defines how far it is possible to move the two arms (9) of the connector in the plane parallel to the base part (2). It is necessary for the corresponding means (10) in the arms (9) of the connector (0A) to be of less width than the distance between (I) and (II). In a preferred embodiment it would also be possible to free the connector (0A) from the infusion part (0B) by moving the arms (9) in a vertical direction away from the base part (2). If this should be possible the arms (9) of the connector need to be adequately flexible where the arms (9) are fixed to the central part of the connector. This can be done either by reducing the thickness of the arms (9) in at least on direction in this area until the desired flexibility is achieved or by choosing to construct the connector part (0A) of a material with a suitable flexibility.

[0086] In this embodiment the release liner (41, 42) of the adhesive support (1) is divided into to separated pieces. The first piece (41) is protecting the part of the adhesive support (1) in front of the cannula (5), and the second piece (42) is protecting the part of the adhesive support being behind the cannula (5) and under the infusion part. During insertion the two pieces are separated whereby the part of the adhesive in front of the cannula is bent up and the adhesive side of the adhesive support (1) is exposed around the cannula. The first piece (41) is either pulled back by the user or is attached to one side of the injector device; the second piece (42) is attached to the opposite side of the injector device.

[0087] Fig. 35A-E and 36A-E illustrates the cycle of use of the injector device seen respectively from the upper (fig. 35) and the lower (fig. 36) side of the injector device.

[0088] In fig. 35A and 36A the device is in a first state, which is the state the device would normally be delivered to the patient in, under sterile conditions. In

this state the pivoting arm (36) is in a position where it embraces the needle (35) and the angle v between the main plane of the injector device and the pivoting arm is approximately 0°, if the release means (39) should unintentionally be pressed in this situation two protruding tabs (48) will prevent the slidable member (32) from being pushed forward.

[0089] In fig. 35B and 36B the device is prepared for use by lifting the pivoting arm (36) backwards thereby exposing the insertion needle (35) and also in this embodiment lifting the part of the release liner (41) which is attached to the pivoting arm (36), exposing the underlying adhesive support (1). In this position the pivoting arm (36) allows for insertion of the needle and is in an angle v to main plane of the injector device where 9O°≤ v <180°, and in this position the injector device would be placed against the patient's skin.

[0090] In fig. 35C and 36C the release means (39) has been pressed and has released the spring (34). The spring has pushed the slidable member (32) forward until the slidable member was stopped by two stopping tabs (43). In this position the insertion needle (35) has penetrated the patient's skin and a part (this part covers an area around the needle in the full breadth of the adhesive support) of the adhesive surface of the adhesive support (1) is in contact with the patient's skin. In fig. 36C it is shown how the second part (42) of the release liner is attached to the housing (30) and still covers the adhesive surface when the slidable member (32) is pushed forward.

[0091] In fig. 35D and 36D it is shown what happens when the injector device is removed from the patient, leaving the infusion part (0B) inserted subcutaneously. The user frees the first part (41) of the release liner from the pivoting arm (36) and then when pulling the injector device away the second part (42) of the release liner is also pulled away, exposing the adhesive surface of the adhesive support (1) and making it possible for the user to press the adhesive support towards the skin and thereby securing the infusion part (0B).

[0092] Finally after withdrawal of the insertion needle which in this embodiment is attached to the slidable member (32) in the injector device, it is

shown in fig. 35E and 36E how the pivoting member (36) is placed in a position where it is embracing the needle thereby protecting the surroundings from getting stung. In order to get into this position the pivoting arm (36) is turned approximately 180° from the position in fig. 35D and 36D, and the angle w between the main plane of the injector device and the pivoting arm (36) is approximately 90°.